Crafting Digital Transparency: Implementing Legal Values into Algorithmic Design

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Abstract

According to the EU's General Data Protection Regulation, transparency should be considered by design in data processing activities. Transparency entails the promise of control and legitimacy: if we can see inside algorithmic systems, we can ensure compliance with legal rights and principles. But is "by design" able to ensure compliance? I interrogate the relationship of law and technology by asking how law can capture the products and intricacies of design processes. Combining socio-legal and science and technology studies, I argue that "transparency by design" does not exert meaningful control. I assert that design should be understood not only as production of algorithms but as human-driven contextual social processes, in which values are prioritized and negotiated, ignored and assumed, and at times fought over and compromised. Design processes often lack transparency and democratic participation, leading to legitimacy gaps. Yet transparency *of* design is not at the core of data protection. Despite the limitations of transparency, transparent design would make these social practices explicit and reintroduce participation. Furthermore, it re-politicizes technological design by creating space for value prioritization and operationalization. The shift to design facilitates a discursive turn to procedural language of access to justice. If we prioritize access alongside transparency as a guiding design constraint, the humans involved in design processes and interacting with algorithmic systems become visible, giving us new tools, e.g., measurable accessibility and usability, for legally informed technological design.

I. The Promise of Transparency by Design

Transparency incorporates the architectural metaphor of looking inside. Metaphors are persuasive instruments that shape reality; hence, they matter. We attribute to transparency the promise of power and control over architecture. These architectures might be physical and tangible, like the glass wall, or immaterial and abstract, like those of algorithmic systems. The metaphor of seeing inside is connected with shifting configurations of power and control, which are entwined with the societal processes of digitalization. Through transparency, we can see with our own eyes how we are controlled, and we can exert control in return. Still, our control is limited metaphorically: it promises us a view of the inside from the outside, but can we get in? Could an alternative architectural metaphor be found to take us over the threshold, to grant us access to the inside, rather than only letting us gaze in?

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Humans are increasingly governed through algorithmic systems in their everyday activities, both in private and public spheres. Public administrations are automating their decision-making processes, from taxation and social security to immigration and border control. These developments enable algorithmic governance, a distinct form of social ordering that emerges from the increasing use of relatively autonomous software.[1] At the core of these new forms of governance are the statistical inferences produced through automated, encoded procedures that transform input data into a desired output.[2]

Within law, automated decision-making has become a central conceptualization of the regulatory challenge. The conceptualization derives its institutional basis from General Data Protection Regulation (679/2016, GDPR), which introduced a data subject's right not to be subjected to automated individual decisions. Yet this essay hopes to detach from this perspective. Instead, I discuss what precedes the use of algorithmic tools, namely the different dimensions of technological design that give shape to this use. The focus is on the relationships between law, technological design, and human behavior within material and immaterial architectures.

Technological design may exacerbate existing discriminatory structures or introduce new forms of injustice which existing legal frameworks struggle to capture.[3] Research on algorithmic discrimination demonstrates how societal biases become embedded in training datasets as well as in the architectural choices.[4] Yet discrimination is not limited to technological architectures, and discriminatory structural practices often remain implicit in society despite continuous policy and legal action.[5] Still, the ethical anxiety over algorithmic bias has contributed to the formulation of a plethora of ethical guidelines for AI that advocate transparency as a panacea.[6] The GDPR obligates organizations to implement transparency by design and by default. But does transparency by design prevent the unwanted consequences of bad algorithmic design? And does its feasibility depend on what is made transparent? Ultimately, how can law capture technological design?

In this essay, I have adopted a socio-legal procedural perspective to technological design. The approach is complemented by science and technology studies (STS) that

[1] Karen Yeung & Martin Lodge, Algorithmic Regulation (2019).

[2] Tarleton Gillespie, The Relevance of Algorithms, in Media Technologies: Essays on Communication, Materiality, and Society 167 (Tarleton Gillespie et al. eds., 2014).

[3] Fundamental Rights Protection Online: The Future Regulation of Intermediaries (Bilyana Petkova & Tuomas Ojanen eds., 2020).

[4] Betsy Anne Williams et al., How Algorithms Discriminate Based on Data They Lack: Challenges, Solutions, and Policy Implications, 8 J. Info. Pol'y 78 (2018); Safiya Umoja Noble, Algorithms of Oppression: How Search Engines Reinforce Racism (2018); Sandra G. Mayson, Bias in, Bias out, 128 Yale L.J. 2218 (2019).

[5] Martha T. McCluskey, Rethinking Equality and Difference: Disability Discrimination in Public Transportation, 97 Yale L.J. 863 (1988); Kimberlé Crenshaw, Demarginalizing the Intersection of Race and Sex: A Black Feminist Critique of Antidiscrimination Doctrine, Feminist Theory and Antiracist Politics, 1989 U. Chi. Legal F. 139 (1989).

[6] For an overview, see Thilo Hagendorff, The Ethics of AI Ethics: An Evaluation of Guidelines, 30 Minds & Machines 99 (2020).

demonstrate the intricate ways in which technological design embeds human values and ideologies either inadvertently or by choice. As transparency is connected with the promise of rendering the abstract tangible and therefore controllable, transparency by design is in danger of materializing design into its products. While the approach may alleviate the notorious AI black box problem and introduce monitoring mechanisms, it simultaneously obscures the humans involved in design processes. Transparency by design may reinforce the notion that regulatory action should focus on the products and not the processes of design. I argue that instead of algorithmic systems, we should concentrate on the social processes in which value-laden design choices are made.

When we shift the focus to processes, a reading that the EU's data protection framework seems to enable, we gain two additional perspectives. First, we can examine technological architectures in terms of procedural concepts, tools, and frameworks and hence enrichen the debate on algorithmic governance with the vocabulary of access to justice. Second, the procedural framing draws attention to the social processes of design, struggling against the materialization entailed in transparency. The processes make visible the humans involved in and affected by different design choices and frame design processes as social interactions between individuals and groups of people, emphasizing questions of representation, participation, and access. These values are also at the core of democratic legitimacy and legislative processes, another example of the design of abstract architectures.[7]

I have built my argument in three steps. First, I discuss the concept of design to demonstrate how design is not about technological artifacts but rather about social processes in which compromises are negotiated and conflicts managed between those involved. The aim of this analysis is to contextualize what is meant by transparency by design and to emphasize the similarities between legal and technological architectures. Next, in section III, I examine the object of transparency by design in the GDPR. Although the GDPR's transparency obligations explicitly refer to data processing activities and not algorithmic systems, the framework cannot escape the implicit assumption of technological artifacts embedded in the logic and means of transparency. In section IV, I elaborate the procedural perspective on algorithmic systems and return to the architectural similarities between law and technology as products of value-sensitive design. Despite the limitations of proceduralization, this framing brings to light the humans that determine who are the perceived users of algorithmic systems. Furthermore, the focus on design processes enables us to adopt alternative design principles alongside transparency—for example, accessibility and usability—that just might get us to the inside of technological architectures.

[7] Langdon Winner, Do Artifacts Have Politics?, 109 Daedalus 121 (1980).

II. Designing Technology and Law: Architectural Similarities of Abstract Structures

A. Technological Design Is Not Value-Neutral

What is design? According to the Cambridge Dictionary, design refers to the creation or production of something for a specific purpose, a thing fabricated according to a plan to serve a given function or solve a given problem. Design is a process of human creation dating back thousands of years.

One of the most famous design theorists of the twentieth century, architect and urban designer Christopher Alexander, explored the recipes for designing well-constructed spaces. In his 1979 book, *The Timeless Way of Building*, Alexander introduced the concept of "quality without a name," to describe good design solutions one can instantly recognize as such through feelings of contentment and delight but which remain difficult to explain.[8] Alexander sought to collect reusable design solutions that would result in desired social interaction within urban landscapes, making the connection between architecture and social interaction explicit.

Alexander's 1970s concept of design patterns, repeatable design solutions for certain reoccurring problems, was later adopted by the software engineering community, which translated the concept from tangible, physical architecture to immaterial and abstract software structures.[9] The translocation of design patterns from urban planning to software design emphasizes the obvious connection between design activities and technological architectures as the product of such processes. Although architectural design relates to something concrete and physical, abstract structures such as law and interconnected digital networks should also be understood as the result of design choices. However, the abstractness and immateriality of such structures can be questioned, as they too are connected with the physical world in which they have impact, and there is no clear distinction between the social and the material.

Hence, technological systems, like other forms of architecture, are always designed and their form does not emerge spontaneously. This is why it makes sense to talk about the subjectivity of humans within technological design. Because of the very nature of human-driven design, technological solutions can never be neutral, although they can be subjective either inadvertently or by choice. It was established early on that technological design incorporates values and ideologies of the designers and others involved in the design

[8] Christopher Alexander, The Timeless Way of Building (1979).

[9] See generally Frederick P. Brooks, Jr., No Silver Bullet: Essence and Accident of Software Engineering, 20 Computer 10 (1987); see also Erich Gamma et al., Design Pattern: Elements of Reusable Object-Oriented Software (1994).

process.[10] Also, STS highlights values and social practices which shape technologies.[11] As early STS scholar Langdon Winner argued in the 1980s, the political cannot be separated from technology.[12] Winner contextualizes his groundbreaking analysis in between two earlier traditions of social studies that focused on technological change: the deterministic and the social constructivist accounts of technology. The deterministic accounts emphasized the inherent qualities of artifacts that are decisive in shaping the consequences of their use. In turn, the constructivist approaches aimed to describe how social environments and stratification of society define such consequences. According to Winner, his theory of technological politics complements the latter perspective of social shaping of technology, which erroneously reduces politics of artifacts to social circumstances.

In his seminal article, Winner distinguished two ways that artifacts gain political properties. The first includes artifacts designed or deployed to settle an issue, particularly human community. He drew his example from urban planning in New York City, where the city's infamous "master builder" Robert Moses used design to enforce his social and racial prejudices by building bridges too low for public buses to pass under, effectively prohibiting certain low-income groups and social minorities from access to certain areas of the city. The example of Moses's low bridges has become a much-referenced anecdote in social science studies on technology, gaining momentum as well as critique through its narrative appeal.[13] Despite the fact that the story has taken various incarnations, changing in form to suit the argument at hand better, it does reflect the very physical obstacles to social interaction that fabricated architectures may have.

According to Winner, the political nature of such artifacts is dependent first and foremost on the decision to deploy (or not deploy) the technology in question and subsequently on the "seemingly innocuous design features [that] actually mask social choices of profound significance."[14] These artifacts can acquire political properties depending on the context and design choices. Winner differentiates these from the more rigid, inherently political technologies, devices, and systems that are usually connected to certain configurations of power and authority in society. For example, the atom bomb with its destructive capabilities needs a centralized and hierarchical chain of command, calling for authoritarian and rigid social configurations. Inherently political technologies do not

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[10] Lewis Mumford, Authoritarian and Democratic Technics, 5 Tech. & Culture 1 (1964); Kenneth C. Laudon, Computers and Bureaucratic Reform: The Political Functions of Urban Information Systems (1974); Winner, supra note 7; Helen Nissenbaum, Values in Technical Design, in 1 Encyclopedia of Science, Technology, and Ethics lxvi (Carl Mitcham ed., 2005); Taina Bucher, If . . . Then: Algorithmic Power and Politics (2018).

[11] Bruno Latour, Science in Action: How to Follow Scientists and Engineers Through Society (1987); Sheila Jasanoff, The Idiom of Co-Production, in States of Knowledge: The Co-Production of Science and Social Order 1 (Sheila Jasanoff ed., 2004); Andrew Feenberg, Critical Theory of Technology and STS, 138 Thesis Eleven 3 (2017).

[12] Winner, supra note 7.

[13] Bernward Joerges, Do Politics Have Artefacts?, 29 Soc. Stud. Sci. 411 (1999).

[14] Winner, supra note 7, at 128.

grant leeway for their seemingly unimportant design choices but instead the decision to develop and deploy these systems already encompasses an inescapable choice for certain formations of social life, as "there are no alternative physical designs or arrangements that would make a significant difference; there are, furthermore, no genuine possibilities for creative intervention by different social systems—capitalist or socialist—that could change the intractability of the entity or significantly alter the quality of its political effects."[15]

B. Implementing Values into Design Is Difficult

Winner's examination of the inescapable political dimension of technological design also seems to hold true in relation to more abstract and immaterial technological architectures. Interconnected and data-driven algorithmic systems are also design products that incorporate political choices.

Of Winner's two categories—the potentially political but more flexible versus the inherently political and more rigid technologies—either one can be used to describe algorithmic systems being deployed in legal decision-making processes. One can argue that legal institutions reinforce their own authority and control in society through the choices made regarding technological development. Hence, such algorithmic systems cannot escape the centralized and partly authoritarian quality of these institutions. However, the counterargument to this can be found in the legal principles, rules, and mechanisms that aim to govern and prevent the abuse of public power, and the varying degrees of success when applied to this end. From the socio-legal perspective, it becomes evident that principles such as due process, rule of law, and transparency should inform the design of algorithmic systems. In the context of legal decision-making, these values should be made explicit and defined by formal legal structures, and then operationalized within technological design.

But how can we ensure that the right values are taken into consideration in design processes? Helen Nissenbaum's examination of value-sensitive design elaborates the diverse practical challenges associated with applying design methods to implement values into engineering products, processes, and systems.[16] She distinguishes between instrumental and substantive values; the latter is of particular interest to our context of implementing legal principles into algorithmic systems:

> For those committed to bringing selected values to bear in technical design, the ideal result is a world of artifacts that embody not only such instrumental values as efficiency, safety, reliability, and ease of use, but promote (or at least do not undermine) substantive values to which the surrounding societies or cultures subscribe. In liberal democracies such values may include, among others, liberty, justice, privacy, security, friendship, comfort, trust, autonomy, and transparency.[17]

[15] Id. at 134.

[16] Nissenbaum, supra note 10.

[17] Id. at lxvi.

According to Nissenbaum, epistemological challenges arise in design processes because the implementation of values requires their operationalization into design constraints through collaboration between different knowledge domains. While designers are focused on particular design specifications, the philosophical reflection on the origins and interpretations of values is often overlooked. Furthermore, values are contextual and vary across groups and cultures, and so different interpretations of how they are best preserved may lead to different design choices. Additional epistemological challenges arise within empirical inquiry, which is necessary for determining if the final design has succeeded in embodying the values as intended. Nissenbaum emphasizes the political and socio-legal dimension of values, through which normative theory can facilitate balancing and justifying trade-offs when different values conflict.[18] Practical challenges ensue from the sparseness of design methodologies for software engineering, which impede discovery of relevant values, translation between fields required for their operationalization, resolution of conflicts, and the verification of successful implementation.[19]

These insights demonstrate how the design of algorithmic systems is a human-driven social process that encapsulates complex social interactions. In social practices that constitute design, design choices are negotiated, functionalities are prioritized within budgetary limits, and differences of opinions are solved through compromises. These choices can seem trivial, much as Winner argued, and be concerned with minor issues such as the placement of icons on websites. An example of such a seemingly innocuous design choice with severe legal effects can be found in a condemnatory decision given at the highest level of judicial review in Finland, by the Chancellor of Justice.[20] The case concerned a web service deployed by an employment authority for unemployed job seekers entitled to social security benefits. The service had been optimized and tested only for laptop users and important content could not be accessed on mobile devices, which were primarily used amongst job seekers. Thus, mobile users failed to fill in required content, leading to punitive debt recovery. Invoking Finland's constitutional principle of good administration, the Chancellor of Justice emphasized the authority's responsibility to include the end-user perspective in technological design. The authority should have considered their end-users' tendency to use mobile devices during the design and deployment.

To summarize, the concept of technological design transcends the production of the technological artifacts. Ultimately, it draws our attention to the social processes that shape design choices and the social consequences that follow the development and deployment of technological systems. Through social framing, the inherently political nature of design becomes visible and inescapable.

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[18] Id. at lxviii.

[19] Id. at lxix.

[20] OKV/2019/1/2017 (https://www.okv.fi/media/filer_public/10/a7/10a7b1fe-03a9-418e-b11c-55aaf0e152b8/okv_2019_1_2017.pdf).

C. Law as Design and Legitimacy of Architecture?

Following these framings, we come to understand technological design in broad terms as the political choices related to fabricated architectures that affect human behavior in different ways. From this perspective, law as a fabricated social structure can be seen as the product as well as the means of design, echoing legal philosopher Roscoe Pound's notion of law as a powerful technology for social engineering.[21] The overlap between legal and technological structures is apparent. Law as we know it is a product of design, although often implicitly. When our understanding of technology detaches from purely technological artifacts, we are able to conceptualize legal structures as technologies. Also, law embeds values and is designed to produce mechanisms for formulating and building these values into legal concepts, principles, doctrines, and mechanisms.

Within law, this architectural similarity has not gone unnoticed. For example, Lawrence Lessig's famous formulation of code as law highlights how technical infrastructures have become central tools for regulating behavior in digital networked environments like the internet. The software code operates alongside more traditional normative frameworks such as legal regulation, markets, and social norms.[22] Lessig's argument has been criticized as a form of cyber-paternalism, as it reflects concern for the covert and insidious control mechanisms inherent in software code that can be remedied by legislation and transparency of regulation.[23] According to Ronald Leenes, Lessig's approach emphasizes the growing importance of "design-based control mechanisms [that] are extremely powerful because they act ex ante rather than ex post" and thus do not include sanctions or punishments in the traditional legal meaning.[24] But the legitimacy gap of technological design follows from the structural similarities tempered by differing operating logic. Simply put, if code is in fact law, production of code becomes legislative drafting, albeit without the political constraints definitive to legislative processes.

In turn, STS scholar Mireille Hildebrandt discusses the similarities and differences between the normativity of legal rules and the normative consequences of technological architectures. She defines technological normativity as "the way a particular technological device or infrastructure actually constrains human actions, inviting or enforcing, inhibiting or prohibiting types of behavior."[25] Similarly to Lessig, Hildebrandt draws attention to the lack of democratic legitimacy regulation by technological architecture as it is not produced through democratic legislative procedure or reliant on the state's authority. However, the

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[21] Roscoe Pound, Social Control Through Law (1942); cf. Annelise Riles, A New Agenda for the Cultural Study of Law: Taking on the Technicalities, 53 Buff. L. Rev. 973 (2005).

[22] Lawrence Lessig, Code: Version 2.0 (2006).

[23] Andrew D. Murray, Internet Regulation, in Handbook on the Politics of Regulation 274 (David Levi-Faur ed., 2011).

[24] Ronald Leenes, Framing Techno-Regulation: An Exploration of State and Non-State Regulation by Technology, 5 Legisprudence 143, 147 (2011).

[25] Mireille Hildebrandt, Legal and Technological Normativity: More (and Less) Than Twin Sisters, 12 Techné: Research Phil. & Tech. 169, 176 (2008).

impact technological design has on behavior is ultimately defined context-dependently, much in the same way as how law operates on a case-by-case basis: "[T]here is never just one way for a technology to take its place in the socio-technical tissue of the collective."[26]

These structural similarities further emphasize how technological design is about social interaction. Although the difference between legal and technological structures seems inescapable, ultimately they become entwined. Julie Cohen draws attention to the dynamic reciprocity of law and technology, whereby law takes part in shaping the dynamics of technological change and is continuously restructured by it.[27] Legal historian Cornelia Vismann demonstrated how administrative and legal processes have always been developed around a range of media forms, including paper documents, files, and classification structures that shape the processes around them.[28] Simply put, decision-making routines and technological developments have an intertwined history.[29] This is to say that legal processes formed around and within traditional media forms have incorporated value-laden choices that create hegemonic structures of privilege and marginalization. Architectures, physical or abstract, create subjectivity and agency, simultaneously subjugating people to established configurations of power and control and enabling only desirable forms of participation and action. Hence technological design is not simply about implementation of legal rules in algorithmic structures but is also a question of democratic legitimacy, related to the context-dependency of design choices.[30]

How can we employ design methods in the legal and technological architectures to improve inclusion and participation? As Winner argues, the crucial time for value-sensitive design choices is at the introduction of new technologies, such as when the decision is made on development and deployment. After these initial commitments, the choices become set in stone and the original flexibility of design is lost, much in the same way as long-lasting legislation.[31] These insights suggest that values should be defined, elaborated, and translated at the beginning of the design process, taking into consideration the context-dependent variables. This context-dependency of value-sensitive design seems inevitable, posing a challenge for both legal and engineering rationalities, which value preset and consistent generalized rules that entail easy and predictable implementation and operationalization regardless of context.

Finally, the context-dependency of design circles back to agency. Technological design choices tend to privilege certain types of citizens over others, depending on their

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[26] Id.

[27] Julie Cohen, Between Truth and Power: The Legal Constructions of Informational Capitalism (2019).

[28] Cornelia Vismann, Files: Law and Media Technology (Geoffrey Winthrop-Young trans., 2008); see also Lisa Gitelman, Paper Knowledge: Toward a Media History of Documents (2014).

[29] John M. Carroll et al., The Task-Artifact Cycle, in Designing Interaction 74 (John M. Carroll ed., 1991).

[30] Mireille Hildebrandt, Legal Protection by Design: Objections and Refutations, 5 Legisprudence 223, 242 (2011) ("it is important to create democratic accountability concerning design decisions that will effectively rule the polity").

[31] Winner, supra note 7, at 128.

capabilities and agency.[32] Depending on context-specific design rationalities, technology implementation may be coercive or enabling to its users, as design choices and implementation methods influence the work-arounds users develop against systems with low usability.[33] Hence the question of "how do we ensure technological design embeds legal values such as justice, equality, and due process?" cannot be separated from the practice-oriented questions of "who are the end-users and whose agency are we privileging by given design choices?"

In terms of law regulating design, these questions may be addressed through a range of legal frameworks and mechanisms. For example, end-user perspectives are included in the processes of public procurement of information systems,[34] although their legal relevance is not limited to these processes. In addition, the aim of the regulatory frameworks on privacy and data protection is to regulate algorithmic systems. This is seen in the EU's inclusion in the GDPR of provisions on data protection principles that should be implemented in technological design. In the next section I examine these provisions in further detail to find out what is meant by implementing transparency as a guiding principle in the design of data processing activities.

III. Demarcating Transparency by Design in the GDPR Framework

A. Transparency by Design in the GDPR

At first glance, implementing transparency straight into design seems like a perfect solution, if not to all negative consequences of algorithmization, then at least to the notorious black box problem.[35] The black box dilemma can be defined as the combination of regulatory and technological structures that obscure the inner workings of an algorithmic system; this may consist of a combination of proprietary rights related to source code or chosen software engineering techniques that prevent deciphering the exact relationship between system input and output. Yet the concern for technological obscurity is by no means recent and the critique against the transparency panacea precedes the current algorithm debate.[36]

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[32] Lucia Liste & Knut H. Sørensen, Consumer, Client or Citizen? How Norwegian Local Governments Domesticate Website Technology and Configure Their Users, 18 Info., Comm. & Soc'y 733 (2015).

[33] Paul Simon Adler & Bryan Borys, Two Types of Bureaucracy: Enabling and Coercive, 41 Admin. Sci. Q. 61 (1996).

[34] Seungho Park-Lee, Contexts of Briefing for Service Design Procurements in the Finnish Public Sector, 69 Design Stud. 1 (2020).

[35] See, e.g., Frank Pasquale, The Black Box Society: The Secret Algorithms That Control Money and Information (2015).

[36] E.g., Langdon Winner, Upon Opening the Black Box and Finding It Empty: Social Constructivism and the Philosophy of Technology, 18 Sci., Tech., & Hum. Values 362 (1993). These limitations of transparency have also been acknowledged in current AI policy and regulation that emphasize explainability and understandability as related concepts. For an overview of AI ethics debate, see, e.g., Hagendorff, supra note 6.

Since 2018, the GPDR has provided a central legal framework to address issues related to data-driven algorithmization in the EU. Although the GDPR is not the only legal basis within the EU regulating algorithmic transparency, it does form a reference point for regulation and policy.[37] Hence, the ways in which transparency by design is conceptualized in the GDPR helps us to map out what is the intended object of transparency.

The GDPR gives form to two sides of the concept of transparency by design. First, it elaborates the importance and content of transparency as the guiding principle of all data processing. Article 12 on the rights of the data subject conveys transparency obligations in the information given to the data subject regarding the data's processing, requiring that such information needs to be "concise, transparent, intelligible and easily accessible form, using clear and plain language." Before being replaced by the European Data Protection Board, the independent advisory body Article 29 Working Party (WP29) produced guidelines on interpretation of transparency requirements. The WP29 guidelines state that transparency should be understood as user-centric and connected with understandability of data processing, which is the prerequisite for ability to contest. The guidelines also construe transparency as an expression of fairness.[38]

To summarize, transparency is about the data subject's right to be informed about data processing activities in clear and plain language. Here the circular logic of transparency within the data protection framework becomes apparent; the principle of transparency is the objective, which is achieved by transparent information as the means. As Ida Koivisto argues, transparency has become an all-encompassing principle which starts to lose its significance through its over-extensive definition. Transparency is transformed into a performative medium, the object of which is to ensure transparency, but not to grant access to the authentic content behind the performance.[39]

Second, Article 25 on "data protection by design and by default" connects data protection principles with the design of processing activities. The Article creates a concrete obligation for data controllers to implement appropriate technical and organizational measures, including transparency, into the design of data processing activities to ensure the protection of the rights of data subjects. WP29 guidelines support the effective implementation of data protection by design, including a checklist on how to implement data protection principles.[40] According to the guidelines, transparency by design and by default is about information design, i.e. how to fulfil the information obligation in clear,

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[37] It should be noted that algorithmic transparency may serve several functions in addition to guiding designers. For example, transparency is connected with another focal issue of AI regulation of liability, where the principle facilitates the identification of harm and the person responsible. See, e.g., Madeleine Clare Elish, Moral Crumple Zones: Cautionary Tales in Human-Robot Interaction, 5 Engaging Sci., Tech., & Soc'y 40 (2019).

[38] WP29 Guidelines on transparency adopted in 2017 and as last revised and adopted in April 2018, § 4.

[39] Ida Koivisto, Thinking Inside the Box: The Promise and Boundaries of Transparency in Automated Decision-Making, 1 Acad. Eur. L. Working Papers 1 (2020).

[40] WP29 Guidelines 4/2019 on the Interpretation of Article 25.

contextual and comprehensible terms. In addition, the organizational and technological compliance measures may include the introduction of key performance indicators to demonstrate compliance. Interestingly, the data protection framework does not differentiate between organizational and technological means, implying that these are entwined.

The guidelines clarify the temporal dimension of implementing transparency is at the time of determination of the means for data processing and at the time of processing itself. According to the Guidelines, "means for data processing" should be interpreted to range "from the abstract to the concrete detailed design elements of the processing, such as architecture, procedures, protocols, layout and appearance."[41] This interpretation reveals how the object of transparency lies within the architecture of algorithmic systems and how transparency should be understood in relation to the design processes that give shape to automation, including the datafication and proceduralization required for automated data processing. Furthermore, the Guidelines acknowledge the importance of default settings in system design since without them, the data subject "would be overwhelmed by options that he or she may not have the ability to grasp."[42]

Despite the *prima facie* technological neutrality of the GDPR, the interpretation of data protection by design and by default reveal how the object of regulation is ultimately algorithmic systems, the automated data processing activities that define computerized organizational processes.[43] Here, the logic of transparency to render its object visible and tangible is at play. The black boxes of technological artifacts are opened by the transparency obligations of informing data subjects early on in designing data processing activities. Yet the object of transparency remains elusive and immaterial: the provisions come down to the organization's responsibility to assess necessary measures and procedural safeguards and to decide how to present information to the data subject. Ultimately, this translates into demonstratable compliance, performativity which takes the form of quantifiable key performance indicators.

B. Transparency of What?

What, then, is made transparent by design? Janssen et al. argue that transparency is linked with the promise of opening up government through transparent datasets. They perceive transparency by design as referring to both the design processes and the outcomes

[41] Id. § 33.

[42] Id. § 40.

[43] E.g., Dag Wiese Schartum, Making Privacy by Design Operative, 24 Int'l J.L. & Info. Tech. 151, 159 (2016):

> Technically speaking, however, it is the "processing" of personal data which is subject to regulation, not the "information systems" performing this processing. Although there is no 1:1 relationship between "processing" and "information system," it would be feasible to structure and formulate rules of the Directive and the draft General Data Protection Regulation using the term "personal data system" (or equivalent) as a fundamental concept, instead of "processing" of personal data.

of these processes, "the systems and processes for ensuring transparency."[44] Yet transparency by design remains difficult to achieve due to the complex ecosystems in which data and applications are interwoven, challenges which are fundamentally linked with the context-dependency of technology development.

Such transparency of datasets does not grant access to the inner workings of computers for the reasons discussed in earlier research. The growing literature on explainability and understandability of AI has sought to elaborate different techniques for knowing what goes on inside the computer, or alternatively, giving grounds for the automatically produced output. These techniques, which include counter-factual reasoning and source code publicity, demonstrate the shortcomings of transparency: the object of explanation shifts and is no more attainable than the inner workings of the human decision-maker, whom we have come to fear and trust.[45] Simply put, inside the computer, one finds wires and circuits. Inside the human, one finds veins and brain tissue. Neither one of these physical tangible objects reflects the abstract intangible architectures that constitute decision-making processes. Understandably, it has not gone unnoticed that transparency obligations may create double standards by which stricter expectations are imposed on algorithmic systems than are imposed human-driven decision-making processes.[46]

These arguments are not unique to legal decision-making or to data protection and AI regulation. As Winner argued in his critique of the social constructivist approach to technology, the very purpose of black boxes in software engineering is to describe a complex system that performs a certain function without the need to go inside the system itself. According to Winner, the focus on opening the black box hides the effects of technological artifacts on people's behavior, the effects being described as "the social consequences of technical choice."[47] Furthermore, Winner believes that focusing on opening the artifacts and understanding them sidelines attention from what is included and excluded from the agenda of technological design. In addition to voices heard, the non-decisions and silences—that which is left outside intentionally or inadvertently—shape technology's social consequences of technology. The design incorporates assumptions about the perceived users whose needs guide the choices and priorities implemented into system architecture.[48]

It follows from the regulatory framing that much of the socio-legal discussion on "by design" occurs within data protection. Hence, legal scholars have focused on

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[44] Marijn Janssen et al., Transparency-By-Design as a Foundation for Open Government, 11 Transforming Gov't: People, Process & Pol'y 2 (2017).

[45] Riikka Koulu, Proceduralising Control and Discretion: Human Oversight in Artificial Intelligence Policy, 27 Maastricht J. Eur. & Comp. L. 720 (2020).

[46] See also John Zerilli et al., Transparency in Algorithmic and Human Decision-Making: Is There a Double Standard?, 32 Phil. & Tech. 661 (2019).

[47] Langdon Winner, Upon Opening the Black Box and Finding It Empty: Social Constructivism and the Philosophy of Technology, 18 Sci., Tech. & Hum. Values 362, 368 (1993).

[48] People perceive technology different ways, cf. Bucher, supra note 10.

elaborating different design-based means to operationalize legal values directly related to privacy. For example, Hartzog and Stutzman argue that privacy by design should be about prioritizing obscurity, with a range of implementation techniques from access walls and search blockers to de-identification tools.[49] In his examination of privacy by design, Dag Wiese Schartum argues that the concept is too vague and open-ended, which imposes challenges for operationalizing the values. Schartum states that "such a broad definition of the object of design makes it difficult to establish a common and sufficiently concrete design methodology."[50] He proceeds to elaborate four design elements that would help bridge the gap between law and technology and thus facilitate operationalization: architecture design, data design, process design and interface design.[51]

This leads us to the following. We can frame the policy problem related to algorithmic governance as that of the design processes which define what values and ideologies will be reflected in technological architectures and subsequently give rise to social consequences. Formulated in this way, algorithmic design is not simply about giving people legal measures to ensure their personal data is processed automatically in a way they would like but rather about the underlying design choices done within organizations that implement data-intensive algorithmic systems. Yet the transparency requirements in the GDPR do not seem to extend to the design processes of algorithmic systems, as the object of regulation is defined in terms of data and data processing. It seems that the GDPR and the interpretative WP29 Guidelines do not account for the value-sensitive and inherently political nature of design, in which context-specific design choices ultimately shape the social consequences of algorithmic systems. In other words, transparency by design de-politicizes the inescapable value-sensitivity of technological design. In other words, transparency *of design* is not at the core of transparency *by design* in the data protection framework.

But can we make design processes transparent? This would require a shift: from transparency of data processing to transparency of the design processes themselves. This shift would enable us to address the political dimensions of technological design and, by making the value-laden nature of technology explicit, open up new questions. For example, the political dimension of technological design draws attention to participation and inclusion. When we start discussing the transparency *of* design, the question of who is to be granted access to these processes and whose perspectives will be included in the compromises and conflicts that define design choices becomes vital. Transparency of design processes does not guarantee the necessary context-dependency of value prioritization, but it does bring the political dimension and legitimacy gap of design back into focus.

[49] Woodrow Hartzog & Frederic Stutzman, Obscurity by Design, 88 Wash. L. Rev. 385 (2013).

[50] Schartum, supra note 43, at 153.

[51] Id. at 163.

IV. Do Not Worry, There Is a Process: Prioritizing Access of Transparency

Value-sensitive design requires definition and prioritization of principles that should function as design constraints and objectives. Transparency alone is too limited for addressing the negative consequences of algorithmization. Transparency's circular and performative logic is related to making the abstract tangible, and so its promise within technological design is implicitly connected with the technological artifact: the algorithmic system. In this way, transparency also depoliticizes technological design and reduces the political value-sensitive decisions into ensuring transparency as both means and the objective. Hence, transparency by design materializes algorithmic systems and disguises the context-dependency of design choices that ultimately define the social consequences of algorithmization.

An alternative framing that could be adopted alongside or instead of transparency can be found in the procedural language of access to justice, which brings the user perspective back into the debate. The rhetoric of access to design processes can be understood as a way to reintroduce politics and the importance of participation for legitimacy creation into technological design.

The discursive shift to access reflects the growing importance of procedural safeguards and mechanisms discussed in socio-legal scholarship. Mireille Hildebrandt and Katja de Vries emphasize the growing importance of due process and the right to contestation in the face of the computational turn.[52] This line of argumentation has also been elaborated in the GDPR, which stipulates procedural safeguards on data subjects' ability to contest processing of their data, an approach which has also stimulated discussions on how to implement contestability to technological design.[53]

In the context of legal decision-making, values embedded in technological design become even more decisive for legitimacy.[54] The lawyer's straightforward answer to bad design is that algorithmic systems should comply with the existing law. However, it often remains unclear how this should be achieved within design processes, in which the context-dependency of design choices limits the feasibility of generalized rules. The fragmentation of regulatory frameworks is at least partly to blame for the lack of regulatory focus on design processes. For example, legal regimes frame design-related issues in terms of data protection, liability, competition and fundamental rights. In the public domain, regulation of public procurement also shapes the dynamics of technological design processes by implementing a harmonized procedure for public contracts.

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[52] Privacy, Due Process and the Computational Turn: The Philosophy of Law Meets the Philosophy of Technology (Mireille Hildebrandt & Katja de Vries eds., 2013).

[53] See also Marco Almeda, Human Intervention in Automated Decision Making: Toward the Construction of Contestable Systems, ICAIL '19: Proceedings of the Seventeenth International Conference on Artificial Intelligence and Law 2 (2019).

[54] Niklas Luhmann, Recht und Automation in der öffentlichen Verwaltung (1966); Lawrence Lessig, Code and Other Laws of Cyberspace (1999); Gillespie, supra note 2.

Another reason for the inability to capture design within law can be found in the combination of technological neutrality and the implicit medium of human agency in law.[55] Together, these two sides have maintained the status quo whereby legal decision-making is increasingly performed within information systems and legal institutions rely on the deployment of computers, yet this development is disguised from view. Following the famous catchphrase, computerization works in the shadow of the law, where deployment has taken place without much change in legislation or in our conceptualization of decision-making processes. Despite early scholarship acknowledging the constitutional and political dimensions of information systems, on the ground level of legal practice, computer deployment has mostly been perceived as trivial minutiae of improved secretarial work.

Contrastingly, research in the social sciences has elaborated the on-going technological change through hybridization in complex socio-technical systems,[56] through which social practices become defined by human behavior within, around and in collaboration with technological artifacts and processes. However, it is important to also note that the focus on design processes can be used to disguise human agency, when the existence of a process pipeline itself is perceived to produce legitimacy, to grant us the appearance of participation without actually ensuring it in any true sense. In other words, processes should also be understood as technologies of justification.[57] Here is also the allure of proceduralization. Because such procedural perspectives have these inherent qualities, conceptualizations of design processes need to focus on the human actors in addition to procedural structures.

Another fundamental quality of such a procedural perspective on algorithmization is that everything can be construed as a process. This can be interpreted both as a limitation of its explanatory power and an advantage for translation from law to software engineering. We can differentiate between the legal processes such as adjudication and legislation from the automated data processing that constitutes the algorithmization of these traditional legal processes. Furthermore, the design processes that constitute the production of algorithmization need to be differentiated from the processes of using, assessing, and monitoring algorithmic systems–and the procedural design of these processes that follow deployment. In addition, the legitimacy gap of current technological design can also be articulated in relation to political processes that give form and legitimacy to law, as discussed

[55] Koulu, supra note 45.

[56] Typically attributed to Eric Trist et al. in the 1960s in the context of coal mines to refer to the interaction between people and technology at workplaces, based on the paper "The Relations of Social and Technical Systems in Coal Mining," presented at the British Psychological Society in 1950. See Eric Trist, The Evolution of Socio Technical Systems (1981) (https://www.lmmiller.com/wp-content/uploads/2013/06/The-Evolution-of-Socio-Technical-Systems-Trist.pdf). In Trist's definition, technical aspects refer to organizational structure and processes, not necessarily to material technology. Currently, STS/ANT scholars making similar observations locate the starting point as Magoroh Maruyama, The Second Cybernetics: Deviation-Amplifying Mutual Causal Processes, 5 Am. Scientist 164 (1963).

[57] See also Jenni Hakkarainen, Naming Something Collective Does Not Make It One: Algorithmic Discrimination and Access to Justice, 10 Internet Pol'y Rev. (forthcoming).

earlier in relation to Hildebrandt's research. Ultimately, the legal system itself can be construed in terms of on-going proceduralization of legal protection through establishment of mechanisms for its realization. Thus, the procedural perspective is in danger of becoming an all-encompassing *reductio ad absurdum*.

Despite its limitations, the procedural perspective can provide alternative formulations that help us to conceptualize the legitimacy gap related to technological design. Simply put, technological design can and should be understood as an issue of access to justice—both access to value-laden design processes and access as a design value. This approach places emphasis on the similarities between discussions about algorithmization and older debates on procedural thresholds, which prevent those in need of legal protection from seeking it. In other words, the procedural perspective can be used to introduce the concept of access to justice to technological design, both at the level of access to design processes and as a value to be prioritized within these processes.

The visual design of technological interfaces, the preferred default settings and architectural choices that aim to nudge behavior are new formulations of the age-old question of interaction with and within the legal system. This connection has been observed by Ayelet Sela, whose examination of "digital choice architectures" makes the connection between access to justice and technological design explicit. She builds her examination on observations made in user experience and human-computer interaction research that demonstrate how people make decisions differently in digital environments and through mobile phones—often faster and with less deliberation than in analog encounters. The placement of icons on the screen or the order of options in drop-down menus can influence the choices people make, which is a viewpoint that should be taken into consideration when designing technological interfaces for the legal domain.[58] Building on Selat's observations, the regulatory challenge of algorithmization then becomes not so much an issue of transparency of data but instead an issue of access to law, begging the question of which types of obstacles algorithmic systems impose on such access. What, then, is the relationship and difference between transparency and access? If we prioritize transparency over access, do we inadvertently impose more responsibility on those seeking access? Isn't it the law's obligation to provide access and not only transparency?

Unlike transparency, access can be directly linked with usability. This additional perspective of technological design grants us new ways of operationalizing legal protection within abstract architectures: prioritizing access and usability. The rhetoric of access to justice is also relatively easy to conceptualize within the research field of human-computer interaction (HCI), which focuses on interfaces between computers and their users. The legally-oriented concept of access and the HCI-focused concept of usability together provide guidance for value-sensitive design of algorithmic legal decision-making. Here, accessibility and usability become a focal mechanism to explain the implicit assumptions about perceived users and bring out the value-laden nature of design choices that optimize

[58] Ayelet Sela, E-Nudging Justice: The Role of Digital Choice Architecture in Online Courts, 127 J. Disp. Resol. 145 (2019).

certain user groups. In other words, legal conceptualizations can support taking usability seriously in technological design.

Concretely, the development of socio-legally informed usability indicators is a key tool for incorporating access to justice into technological design. Thus, *measurable usability* becomes a prerequisite for digitalization of legal decision-making. This point of departure also derives institutional support from the EU's Web Accessibility Directive (2016/2102) which has been applied to public sector websites since September 2020. The Directive requires public sector bodies to follow specific technical standards and procedural safeguards to ensure accessibility for persons with disabilities. Such legal instruments have the advantage of translating access issues into key performance indicators for usability testing, which have practical relevance for context-specific design.

Notably, the GDPR provides tools for addressing design processes through the obligation to perform data protection impact assessments to assess the risks of data processing activities. Also, the establishment of key performance indicators within the data protection framework can facilitate a shift of focus to usability. However, problems related to quantification reveal the value-laden nature of deciding on relevant indicators. In the end, indicators of abstract things such as access to justice can be criticized as an attempt to measure that which is not measurable. But the practice-oriented reader would counter this critique by pointing out that even insufficient indicators are better than nothing. To say the least, measurable indicators can be used to initiate the debate on who are the ultimate users and whose perspectives are prioritized in design processes, thus making the implicit assumptions explicit.

Yet even good design does not guarantee safety. There are fundamental limitations in the notion of controlling algorithmization through proceduralized control. Even the right design choices are limited in their ability to remove risks associated with hybridization in complex socio-technological systems. For example, sociologist John Perrow discusses human error when accidents happen in complex technical systems and argues that the combined effects of tightly coupled complex systems and a high-risk potential render accidents unavoidable by simple design choices.[59] Hence, access to legal redress remains of uttermost importance.

Finally, we face an issue of democratic legitimacy of technological architectures. Although we should problematize the social practices of technological design, this framing is limited in its ability to conceptualize the sources for negative consequences of algorithmization. Transparency of design processes has the potential to make explicit the human-driven design choices that have a bearing on legal protection, yet there is the inherent risk of proceduralization, through which the establishment of process as regulatory control mechanism constitutes rubber-stamping legitimacy. On one hand, multi-stakeholder models can also be used to legitimize without any true interest to incorporate insights into design. On the other hand, we know that collective epistemic processes lead

[59] Charles Perrow, Normal Accidents: Living with High-Risk Technologies (1984).

to better outcomes in creative problem solving, which is also what technological design fundamentally is.[60]

V. Conclusion

The notion that law should take technological design more seriously and vice versa is not new. Law can constrain and support societally sustainable technological design. This requires the development of a socio-legal perspective on technological design that goes beyond the current interpretation of the EU's data protection framework, in which "by design" is still connected with the data processing activities automated through algorithmic systems, and not the design processes themselves. Without being informed by law, designers make value-sensitive decisions that put law in action with a limited understanding of what legal values should be implemented in technological architectures. In any case, law is left to deal with the fallout from ill-designed technology.

Ultimately, we come back to the architectural metaphor underlying transparency by design. "By design" approaches entail a promise of easy translation between legal and technological architectures. The metaphor of architecture is repeated in the concept of transparency: the window, the see-through veil. The promise of transparency renders its object tangible, understandable and hence less fearsome. Transparency by design promises a safe physical environment, a regulated space that comes without unwanted consequences. Simultaneously, transparency by design remains the prisoner of its metaphorical foundation, connected with the technological artifact that it hopes to render material and controllable. However, a shift away from transparency enables us to focus on the social processes around technology design and the humans involved in the processes.

Transparency of design is not an end in itself, nor the means to an end, but it is a start. Transparency does not replace access. Instead of understanding transparency *by* design in relation to data or algorithmic systems, transparency *of* design enables us to broaden the debate on sufficient policy action on algorithmization of legal decision-making. Through understanding technology and design as also inherent in legal structures, we can capture the importance of value-laden design processes for legal protection. Here, public organizations and legal processes are seen as technologies, as the result of design processes, through which priorities are negotiated and compromises reached, and we perceive how legal tools, conceptualizations and frameworks can address these practices. Understood in this way, access to design processes becomes a tool for fixing the legitimacy gap related to technological design of algorithmic systems. Furthermore, access as a design constraint would help mitigate the marginalizing effects of technological design that follow from limited understanding of usability.

Finally, access over (technological) threshold goes beyond transparency's promise. Such a discursive shift towards access over thresholds provides an alternative architectural

[60] Judith Simon, A Socio-epistemological Framework for Scientific Publishing, 24 Soc. Epistemology 201 (2010).

metaphor; it implies going further, getting to the inside. Within law, such use of language is not novel, but in the context of technological design, the exchange of metaphors reintroduces the perspectives of access to justice research to debates about algorithmization. This approach facilitates a discursive shift in the architectural language from looking in to overcoming obstacles in the way of access. Instead of observers trying to see technological artifacts, the focus on usability and accessibility in design processes enables us to explicitly ask how to get in.